



AFPET FUELS CAPABILITY STUDY

FORCE Concept System Design Review

CMSgt Nelson

FORCE Overview

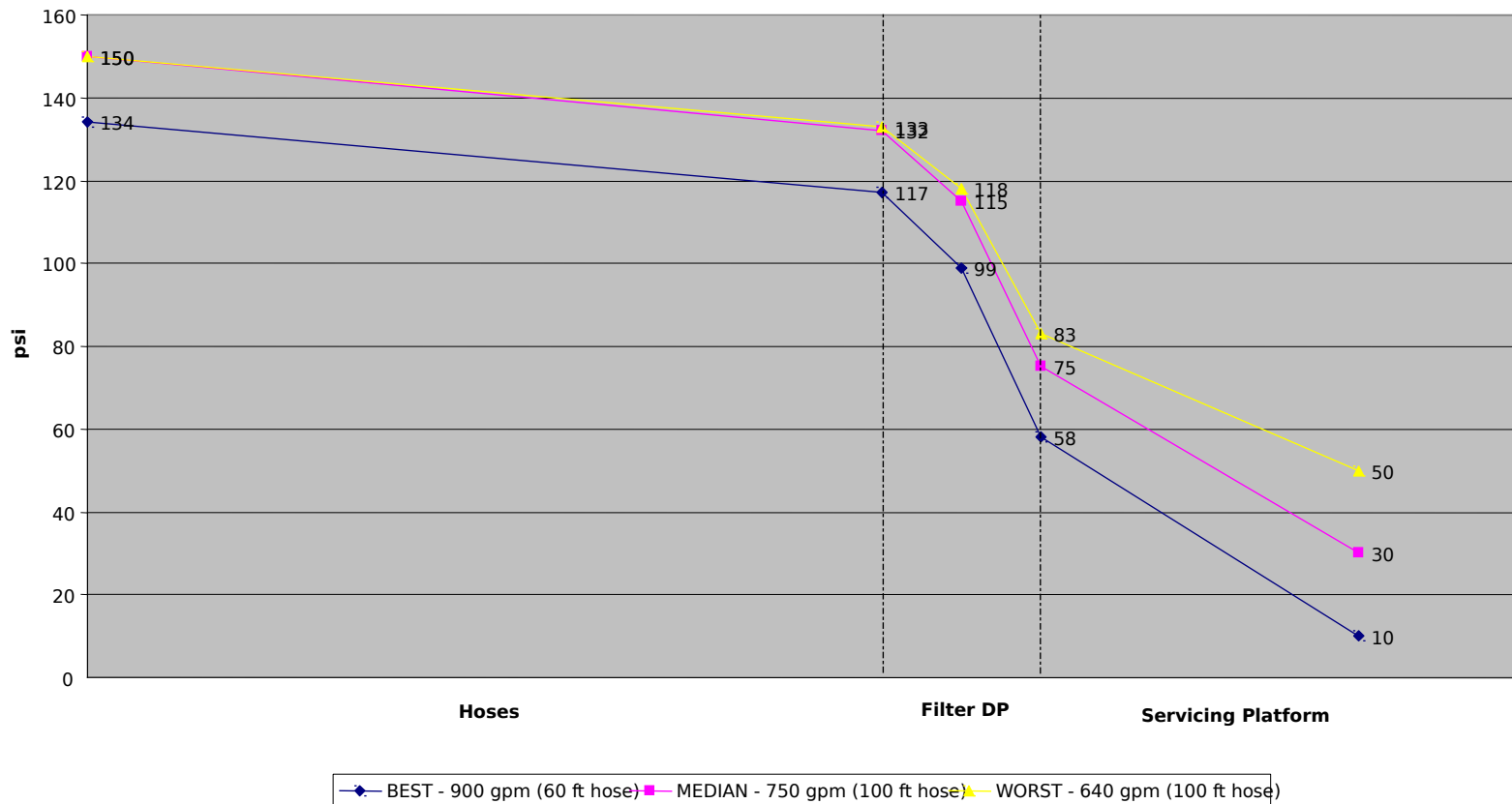
- **FORCE Hydraulic Capabilities**
- **Proposed FORCE Layout Diagrams**
- **FORCE Components**
 - **Filter Separator**
 - **Servicing Platform**
 - **Pump**
 - **Injector**
 - **Automated Tank Gauging**
 - **Deployable Automated Service Station**
- **Purchase Descriptions/Timelines**
- **Road Ahead - What's Next**

Assumptions Applied

- **Minimum of 2 Offload Trucks Simultaneously**
- **Variations Assumed**
 - Elevation Differences Between Modules
 - Fuel in Bladders
 - Filter Element Condition
 - Fuel Level in Aircraft
- **Distance Criteria**
 - 110-ft from Tank Trucks to Receipt Pump
 - 2000-ft Between Receipt and Storage Modules
 - 2000-ft Between Storage and Transfer Modules
 - 1000-ft from Tanks to SP
- **Hose/Coupling Diameters**
 - Receipt – 4” to 6” to 8” Into Pump
 - Storage and Transfer – 6” to 8” Into Pump
 - Leave Hose – 2 1/4” x 60 ft API 1520 Hose

Pressure Profiles

Best/Median/Worst Cases



Hydraulic Performance

➤ Receipt Module

- Optimum = 900 GPM at 111 PSI
- Median = 900 GPM at 129 PSI
- Worst = 900 GPM at 148 PSI

➤ Transfer Module

- Optimum = 900 GPM at 97 PSI
- Median = 900 GPM at 115 PSI
- Worst = 900 GPM at 133 PSI

➤ Dispensing Module (60-ft Issue Hose)

- Optimum = 900 GPM at 150 PSI
- Median = 800 GPM at 150 PSI
- Worst = 695 GPM at 150 PSI

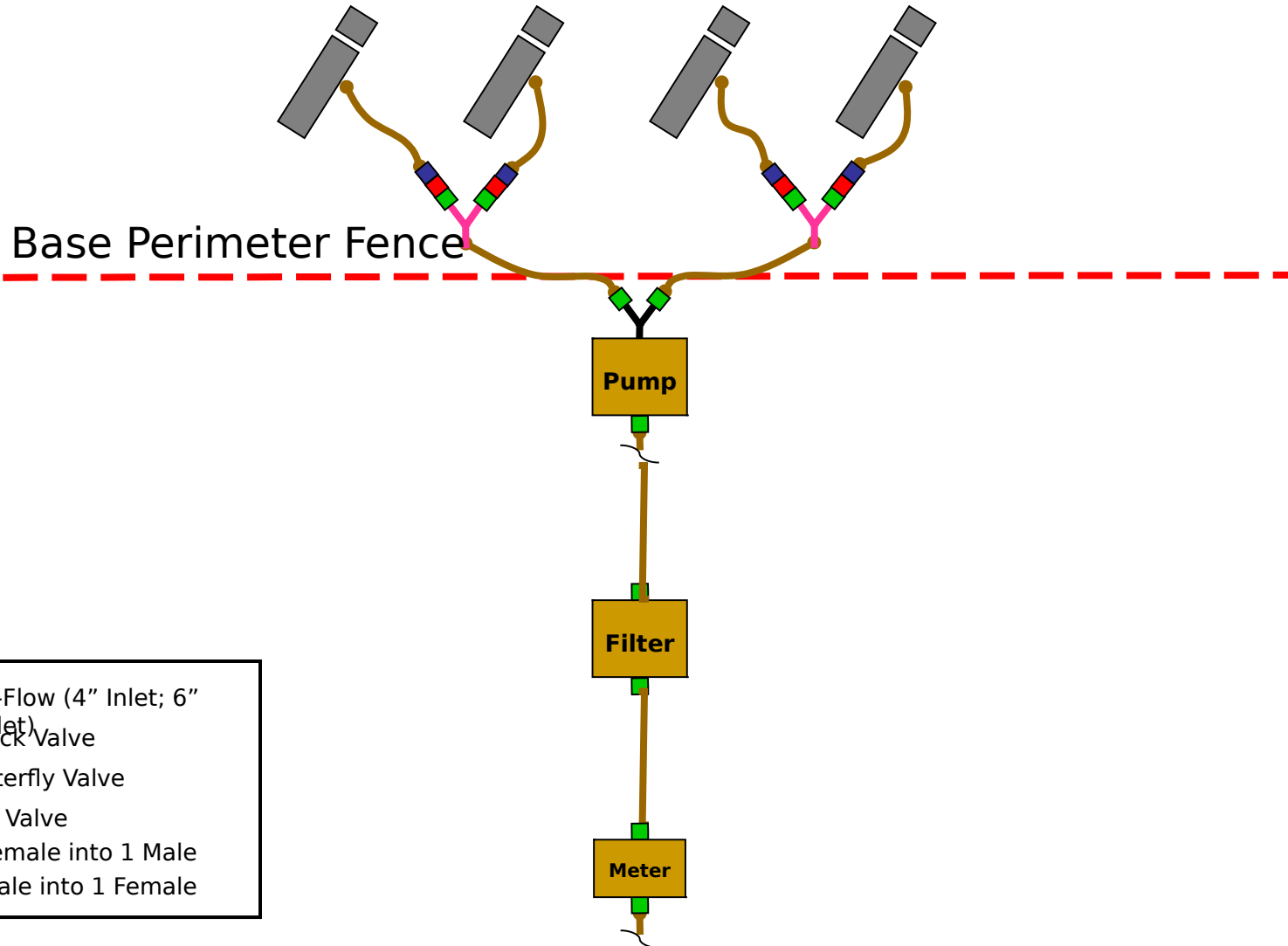
➤ Dispensing Module (100-ft Issue Hose)

- Optimum = 820 GPM at 150 PSI
- Median = 730 GPM at 150 PSI
- Worst = 640 GPM at 150 PSI

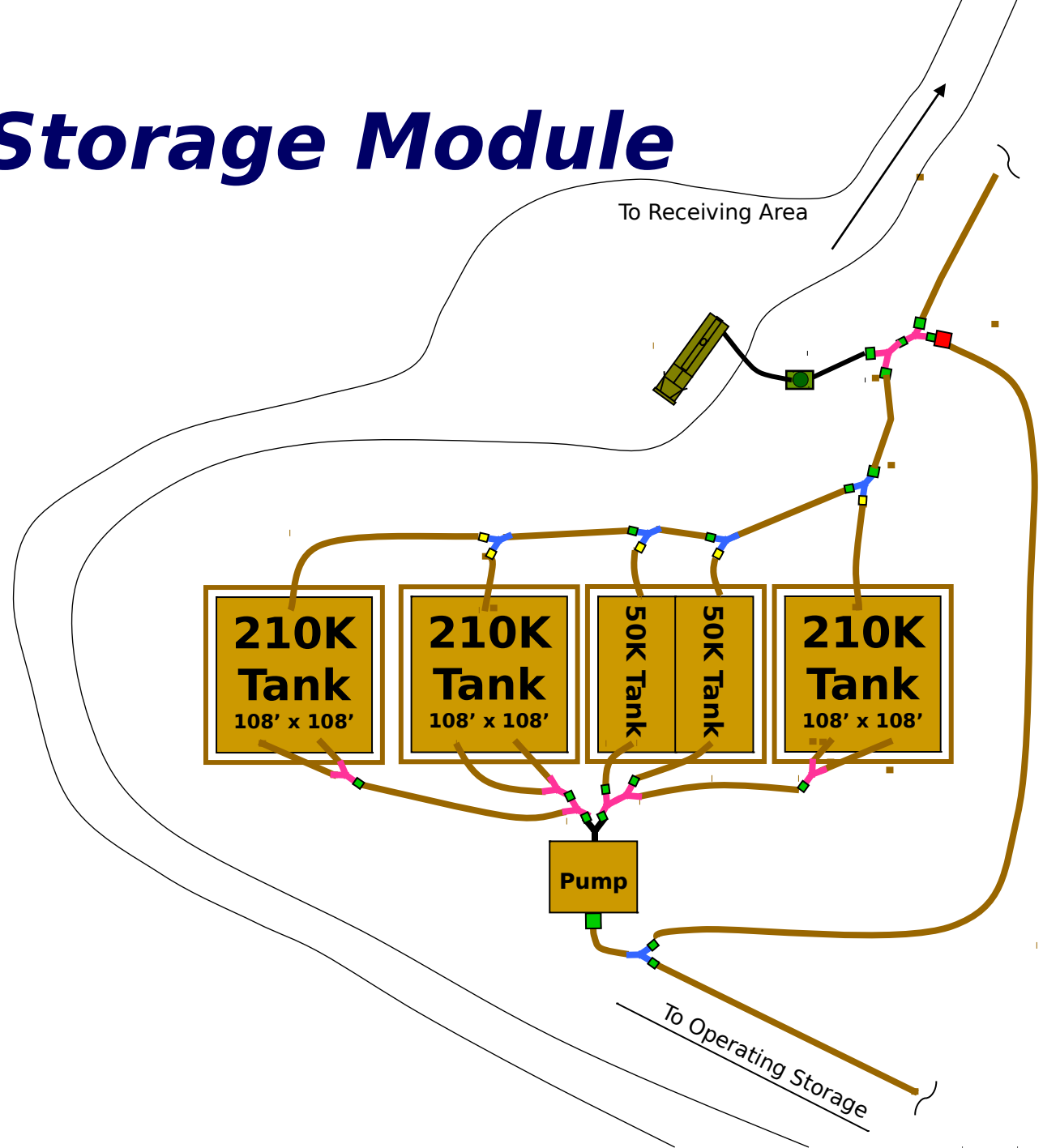
Anticipated Flow Long-Distance Flow

Length, Miles	Rates Max. Flow, GPM
1	900
2	660
3	540
4	465
5	415

Receipt Module

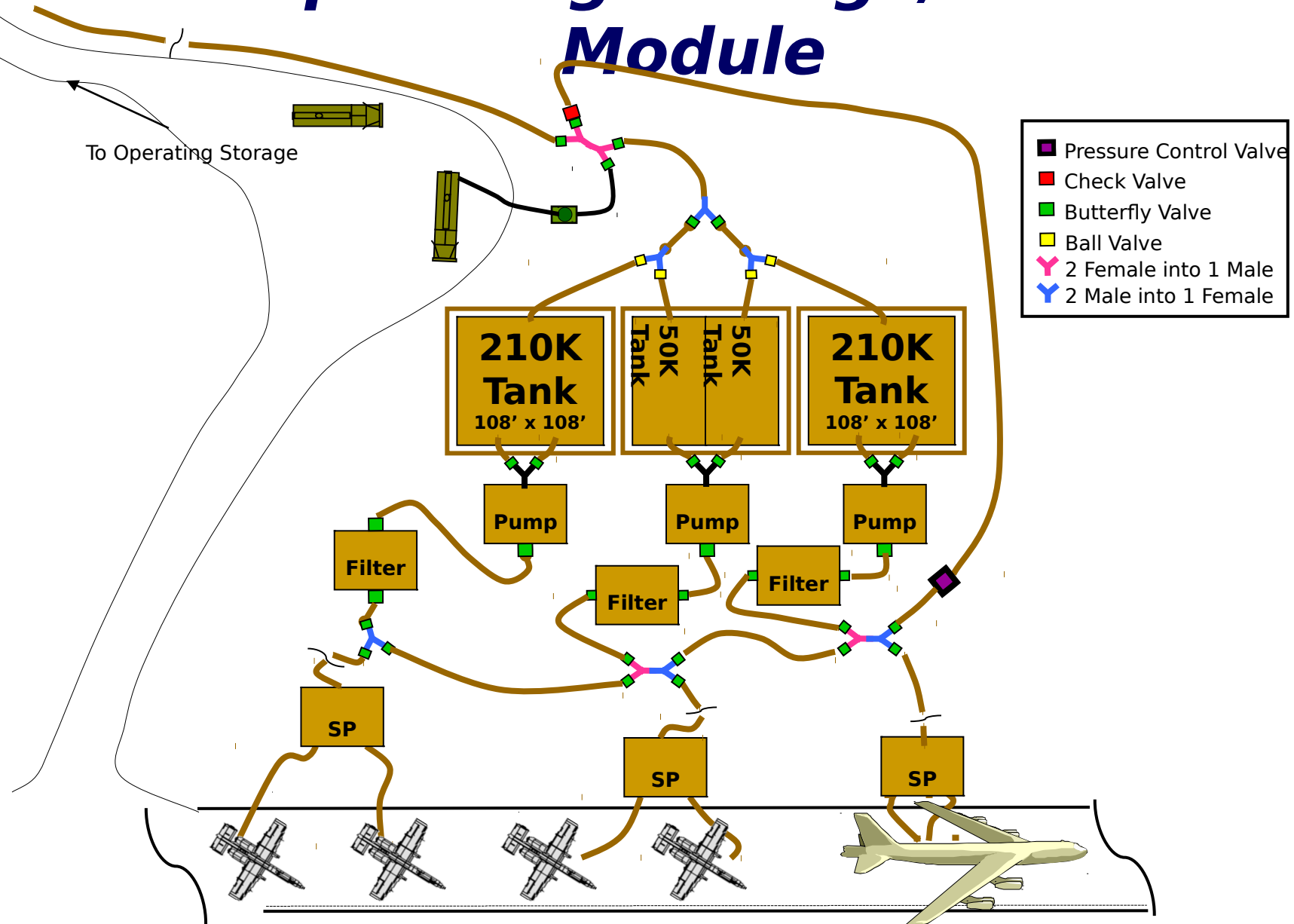


Storage Module



- Check Valve
- Butterfly Valve
- Ball Valve
- Y 2 Female into 1 Male
- Y 2 Male into 1 Female

Operating Storage/Issue Module



Module Components

Hoses

200'

8 x 4" x 25-ft
Hard Hose

744'

62 x 6" x 12-ft
Hard Hose

1380'

70 x 6" x 20-ft
Collapsible Hose

9000'

18 x 6" x 500-
ft
Collapsible
Hose

Valves

66 x 6"

Butterfly Valve

9 x 6"

Ball Valve

6 x 6"

Check Valve

4 x 6"

Visi-Flow

1 x 6"

Control Valve

Tanks

5

210,000 GL
Bladders

4

50,000 GL
Bladders

Y Adapters

11

6" x 6" x 6"
2 Male; 1
Female

12

6" x 6" x 6"
1 Male; 2
Female

Pumps

5

900 GPM
475 TDH/150
HP

Filters

4

600/900
GPM

S/Ps

3

900 GPM
120 x 2.5 Hose

Injectors

1

900 GPM

Meters

1

900 GPM

Strainers

1

900 GPM

Individual Components

➤ **FORCE Components**

- Filter Separator (**Dual 600's**)
- Servicing Platform
- Pump
- Injector (on hold pending task 1 results)
- Automated Tank Gauging
- Ground Servicing Platform

FORCE Filter Separator

- **API 1581 5th Edition Stage 1 & 2 on Trailer**
 - **Trailer mounted; Dual 600's**
 - **6" inlet and discharge**
 - **Takes same filter as Servicing platform and R-11 refueler**
 - **Trailer mounted to speed aerial port processing**

FORCE Servicing Platform

- **FORCE Multiple Aircraft Servicing Platform**
 - **Trailer mounted**
 - **Depends on pressure from hydrant or FORCE pump**
 - **Two 60ft 2 ½ inch API 1529 servicing hoses**
 - **Two 40ft 2 ½ inch hose extensions for cold pit**
 - **600 GPM (50 +/- 5 psi) one hose, 450 GPM both hoses**
 - **Independent RF dead man controls**
 - **Two vertical mounted electric hose reels w/ manual backup**
 - **Automatic Data Collection (ADC) System**
 - **Option for 15ft 6" hard hose with Hydrant adapter**

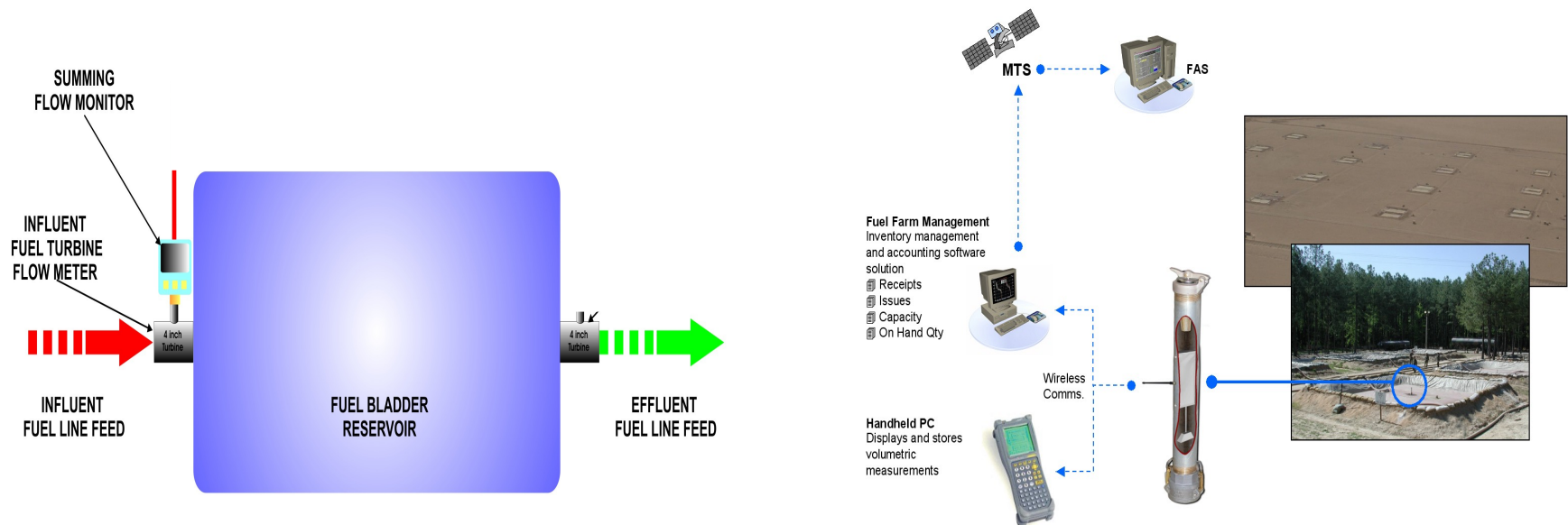
FORCE 900 GPM Pump

➤ FORCE PUMP

- **Trailer Mounted 900 GPM Pump, 475ft TDH, 150 HP**
- **8" inlet, 6" discharge**
- **RF deadman control**
- **Remote Engine Control System**
- **Pressure control valve (150 psi)**
- **Internal bypass pressure control**
- **Automatic air eliminator**
- **Area lighting (3 x 15,000 lumen) floodlights on 15ft telescoping poles**

Automatic Tank Gauging

- **ATG System - Flow Monitoring to a “teachable” gage**
- **Gage can be reprogrammed for use on any bladder in the inventory**



FORCE Deployable Automated Service Station

- **Deployable Automated Service Station**
 - **Trailer mounted generator & twin electric 10 GPM pumps**
 - **Electric start**
 - **Area Lighting Kit**
 - **AFSS automation (self service)**
 - **Line filters**
 - **Two grades of product**
 - **Generator bypass feature for use with commercial power**
 - **Dual 2" camlock inlet**
 - **Both pumps can be used for same product**

Road Ahead - What's Next

- Apr 04 – Completed Purchase Descriptions (PD)
 - Early Apr – PD Finalization Conference
- Apr 04 – Begin Bid Solicitation Process
- Aug 04 – Award Contracts
 - \$14.3M Funding Available in FY04
- FY05 - First Article Field Testing in the AOR
 - \$20.0M Funding Available
- FY06-10 Unfunded Requirement
 - Building \$138.7M (\$ FY04) Into FYDP+1
- FY06 – Field First Operational FORCE Sets